

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

BFN3174 – FINANCIAL MODELLING
(All sections / Groups)

23 OCTOBER 2018
2:30 p.m. – 4:30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **14** pages.
2. Answer **ALL FOUR** questions in **FOUR SEPARATE** Excel spreadsheets in **ONE SINGLE** Excel file.
3. Your Excel file should be named with your **STUDENT ID**, followed by your **NAME**, for example: **111111623_HISHAM.xls**
4. **SAVE** your answers for all questions in the provided **THUMB-DRIVE**.
5. Please also copy your answers together with formulas onto the given templates of Excel spreadsheets in the **APPENDIX**.
6. Mark distributions are shown in the given templates.

Using the templates provided in the Appendix of this question paper to model the following 4 questions in the Microsoft Excel:

QUESTION 1 (25 MARKS)

Your firm is considering two projects with the following cash flows:

Year	Project A	Project B
0	-1000	-1000
1	200	150
2	300	300
3	270	400
4	500	300
5	600	500

- Calculate the payback periods of these two projects. (12 marks)
- If the appropriate discount rate is 12%, rank the two projects based on NPV and IRR. (8 marks)
- Which project is preferred if you rank by NPV and by IRR? (5 marks)

QUESTION 2 (25 MARKS)

On 1/08/2017, you are offered the following bond:

Face value	: RM1,000
Coupon rate	: 10%
Coupon payments	: 1 time per year, i.e. 1/08/2018, 1/08/2019, 1/08/2010...
Bond price	: RM1,190
Maturity date	: 1/8/2022

Continued...

- a. Compute the bond's yield to maturity (YTM) (5 marks)
- b. Compute the duration of the bond. (5 marks)
- c. If interest rate increases by 1%, what would be the approximate change in the bond's price? Using the bond's duration to estimate this change. (5 marks)
- d. Carry out sensitivity analysis for the bond's duration to changes of the coupon rate from 5% to 15%. (10 marks)

QUESTION 3 (25 MARKS)

Considering the following data concerning VKE Company (VKE's stock is not currently listed on a stock exchange).

- Expected return for the market portfolio, $E(r_M) = 12\%$
- Cost of debt, $r_D = 7\%$
- Corporate tax rate, $T_c = 35\%$
- Covariance between VKE Company's stock prices and market portfolio index prices, $\text{Cov}(r_{VKE}, r_M) = 0.6$
- Value of debt, $D = \text{RM}5,000,000$
- Risk free rate, $r_f = 3\%$
- Variance for the market portfolio, $\text{Var}(r_M) = 0.4$
- Value of equity, $E = \text{RM}40,000,000$

Using the template given in the Appendix to model:

- a. the cost of equity for VKE Company. (8 marks)
- b. the weighted average cost of capital (WACC) for VKE Company. (7 marks)
- c. Suppose VKE Company issues its stocks in an initial public offering (IPO). After the IPO the company has 1,000,000 shares, worth RM10 each. Model the WACC for VKE Company after the IPO? (10 marks)

Continued...

QUESTION 4 (25 MARKS):

- a. Use the Black-Scholes model to price a call option on a stock with the following information:

Current stock price (S)	= 20
Exercise price (X)	= 15
Time to maturity (T)	= 0.6
Risk-free rate (r)	= 7%
Standard deviation (sigma)	= 50%

(10 marks)

- b. Produce data-tables that show:

- (i) the sensitivity of the Black-Scholes call price to changes in the exercise price, S.

(5 marks)

- (ii) the sensitivity of the Black-Scholes call price to changes in the time to maturity, T.

(5 marks)

- (ii) the sensitivity of the Black-Scholes call price to changes in the stock volatility, standard deviation (sigma).

(5 marks)

Note: please refer to the templates given in the Appendix for this question.

End of Page

APPENDIX: TEMPLATES FOR ALL QUESTIONS

The given templates in this Appendix are:

1. to be followed exactly when carrying out your modeling in the Microsoft Excel for all of the four given questions.
2. to be used to record answers produced in your Excel spreadsheets for all of the four given questions as follows:
 - Each resulted value should be recorded on the correct cell as it appears on your actual excel spreadsheet in the Microsoft Excel.
 - Formula for each recorded value should be recorded in the 'Excel Formula' column.
 - Formulas for more than one columns can be entered in one single excel cell under the 'Excel Formula' 's column and spaced from one another with a slash "/", or with a comma ",".

ANSWER FOR QUESTION 1 (25 MARKS):

	A	B	C	D	E	F	G	H
1	INPUT ZONE							
2	Interest rate	12%						
3								
4	MODELLING ZONE							
5	1a. (12 marks)							
6	Year	Project A	Project B	Cumulative CFs for Project A	Cumulative CFs for Project A	Payback Period for Project A	Payback Period for Project B	Excel Formula
7	0	-1000	-1000					
8	1	200	150					
9	2	300	300					
10	3	270	400					
11	4	500	300					
12	5	600	500					
13				(3 marks)	(3 marks)	(3 marks)	(3 marks)	
14	1b (8 marks)							
15	NPV			(2 marks)				
16	NPV's Ranking			(2 marks)				
17								
18	IRR			(2 marks)				
19	IRR's Ranking			(2 marks)				
20								
21	1c (5 marks)							
22	Investment Decision according to NPV			(2.5 marks)				
23								
24	Investment Decision according to IRR			(2.5 marks)				
25								
26								

ANSWER FOR QUESTION 2 (25 MARKS):

	A	B	C	D
1	INPUT ZONE			
2	Face value (RM)			
3	Coupon Rate			
4	Coupon payment per year			
5	Bond price (RM)			
6	Issuance date			
7	Maturity date			
8				
9	MODELLING ZONE		EXCEL FORMULA TO BE RECORDED IN THIS COLUMN	
10	1a.			
11	Coupon payment per year			(1 mark)

ANSWER FOR QUESTION 2 (25 MARKS) (CONTINUED...):

	A	B	C	D
12				
13	Date	Cash Flows		
14				(1 mark)
15				(1 mark)
16				
17				
18				
19				(1 mark)
20				
21	YTM			(1 mark)
22				
23	1b.			
24	DURATION			(5 marks)
25				

ANSWER FOR QUESTION 2 (25 MARKS) (CONTINUED...):

	A	B	C	D
26	1c.			
27	Change in interest rate			
28	Potential Change in the			
29	Bond's Price			(5 marks)
30	1d.			
31	SENSITIVITY ANALYSIS			
32				
33	Coupon rate	Duration		
34				(5 marks)
35	5%			(5 marks)
36	6%			
37	7%			
38	8%			
39	9%			
40	10%			
41	11%			
42	12%			
43	13%			
44	14%			
45	15%			

ANSWER FOR QUESTION 3 (25 MARKS):

	A	B	C
1	INPUT ZONE		
2	$E(r_M)$		
3	r_D		
4	T_C		
5	$\text{Cov}(v_{ke}, r_M)$		
6	D		
7	$\text{Var}(r_M)$		
8	r_F		
9	Value of Equity E before the IPO		
10	Share Price		
11	Number of Shares		

ANSWER FOR QUESTION 3 (25 MARKS) (CONTINUED...):

A	B	C	D
13	MODELLING ZONE	EXCEL FORMULA	
14	A. Finding the company cost of equity.		
15	β		(4 marks)
16	r_E		(4 marks)
17			
18	B. Finding the company WACC.		
19			
20	$V=D+E$		(3 marks)
21	WACC		(4 marks)
22			
23	C. WACC after the IPO		
24			
25	Value of Equity after the IPO		(3 marks)
26	$V=D+E$		(3 marks)
27	WACC		(4 marks)

ANSWER FOR QUESTION 4 (25 MARKS):

	A	B	C	D
1	INPUT ZONE			
2	Stock Price (S)			
3	Exercise Price (X)			
4	Risk-free rate (r)			
5	Time to Maturity (years) (T)			
6	Standard deviation (Sigma)			
7				
8	MODELLING ZONE		EXCEL FORMULA	
9	d_1			(2 marks)
10	d_2			(2 marks)
11				
12	$N(d_1)$			(2 marks)
13	$N(d_2)$			(2 marks)
14				
15	Call price			(2 marks)

ANSWER FOR QUESTION 4 (25 MARKS) (CONTINUED...):

	A	B	C	D
19	SENSITIVITY ANALYSIS			
20	Stock price	Call Price	EXCEL FORMULA	
21				(2 marks)
22	5			(3 marks)
23	10			
24	15			
25	20			
26	25			
27	30			
28	35			
29	40			
30	45			
31	50			
32	55			
33				

ANSWER FOR QUESTION 4 (25 MARKS) (CONTINUED...):

	A	B	C	D
34	Time to Maturity	Call Price	EXCEL FORMULA	
35				(2 marks)
36	0.30			(3 marks)
37	0.50			
38	0.60			
39	0.90			
40				
41				
42	Standard Deviation	Call Price	EXCEL FORMULA	
43				(2 marks)
44	5%			(3 marks)
45	10%			
46	15%			
47	20%			
48	25%			
49	30%			
50	35%			
51	40%			
52	45%			
53	50%			
54	55%			

